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II

LANDSAT PROGRESS REPORT

FOR THE PERIOD 12 MAY TO 11 AUGUST, 1975

PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA

CONTRACT NO. NAS5-20907

BREVARD COUNTY PLANNING DEPARTMENT

REPORT NO. BCPD L2-2

(E76-10022) PLANNING APPLICATIONS IN EAST
CENTRAL FLORIDA Progress Report, 12 May -
11 Aug. 1975 (Brevard County Planning Dept.,
Titusville) 24 p HC \$3.50
CSC 08B

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LANDSAT PROGRESS REPORT
FOR THE PERIOD 12 MAY TO 11 AUGUST, 1975
PLANNING APPLICATIONS IN EAST CENTRAL FLORIDA

CONTRACT NO. NAS5-20907

REPORT NO. BCPD L2-2 *eto*

Principal Investigator: John W. Hannah*

Co-Investigators: Dr. Garland L. Thomas*
Fernando Esparza**

Computer Programming: James J. Millard**

REPORT NO. BCPD L2-2

Original photography may be purchased from:
EROS Data Center
10th and Dakota Avenue
Sioux Falls, SD 57198

- * Brevard County Planning Department
- ** NASA, Kennedy Space Center

A. PROBLEMS

No unanticipated problems are impeding the progress of the investigation.

B. ACCOMPLISHMENTS

St. Johns National Wildlife Refuge

A 4000 acre marsh region bounded on the east by Interstate Highway 95 and on the south by Florida Highway 50, has been established by the U. S. Fish and Wildlife Service as the St. Johns Wildlife Refuge, primarily to protect the Dusky Seaside Sparrow. Dr. James L. Baker, wildlife biologist with that organization, in a study of the dusky seaside sparrow and its preferred habitat, has made a vegetation map of the refuge based on ground observations and color infrared photography. Convenient access to this good quality ground truth and the collaboration of Dr. Baker suggested this refuge as an appropriate site for a vegetation-mapping experiment.

The preferred habitat of this sparrow is high-to-medium density spartina (a marsh grass) with no trees nearby. An increase in spartina density corresponds to an increase in marsh wetness. A version of Dr. Baker's vegetation map which is relevant to the bird's preferences and also suitable for Landsat comparison is shown as Figure 1.

Representative points for the classes shown in Figure 1 were chosen by Dr. Baker as training samples for a maximum likelihood classification of Landsat data, with the result shown in Figure 2. Tracing of the pattern of Figure 2 gives the result shown in Figure 3. Use of shading film to show the vegetation pattern gives Figure 4, which may be compared with Figure 1.

The bird, then, prefers to live where the map shows a mixture of B's and *'s, with no trees close by. Figure 5 is a thematic map showing the preferred habitat in terms of B's and *'s. Generally, the preferred habitat



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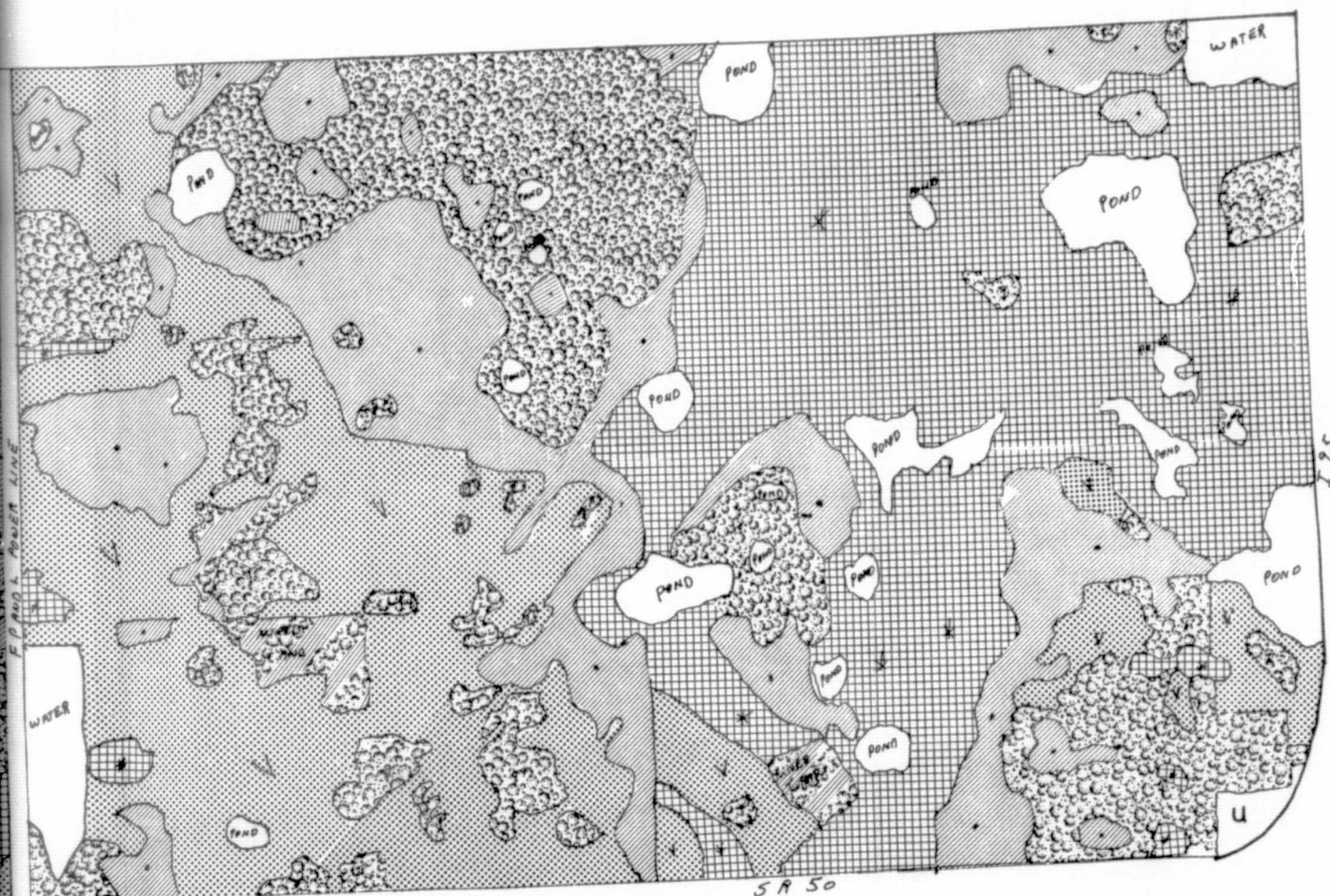


Figure 1

ST. JOHNS NATIONAL WILDLIFE REFUGE
GROUND TRUTH MAP

Trees, shrubs



Dense spartina



Medium density spartina



Sparse spartina



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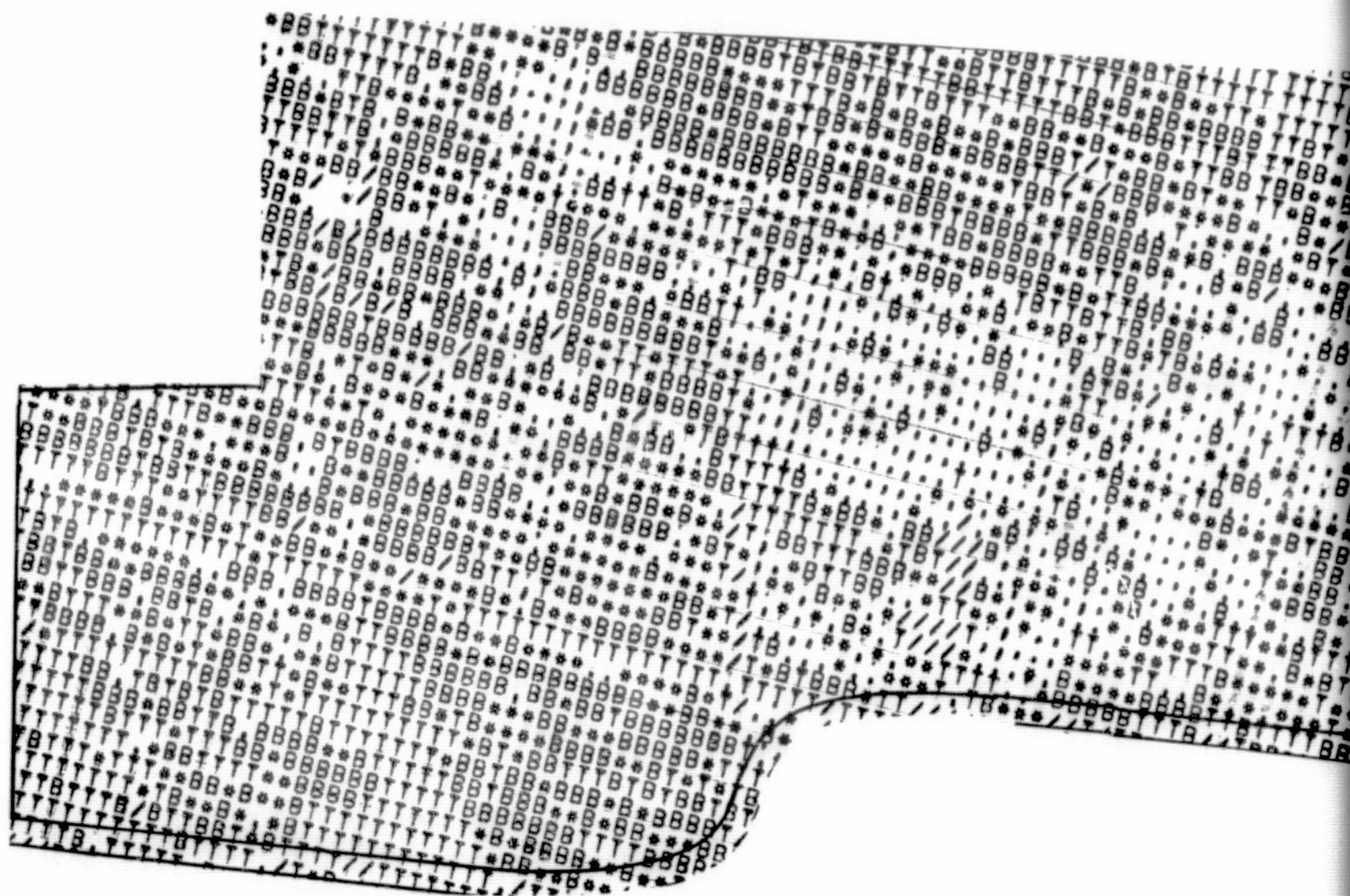


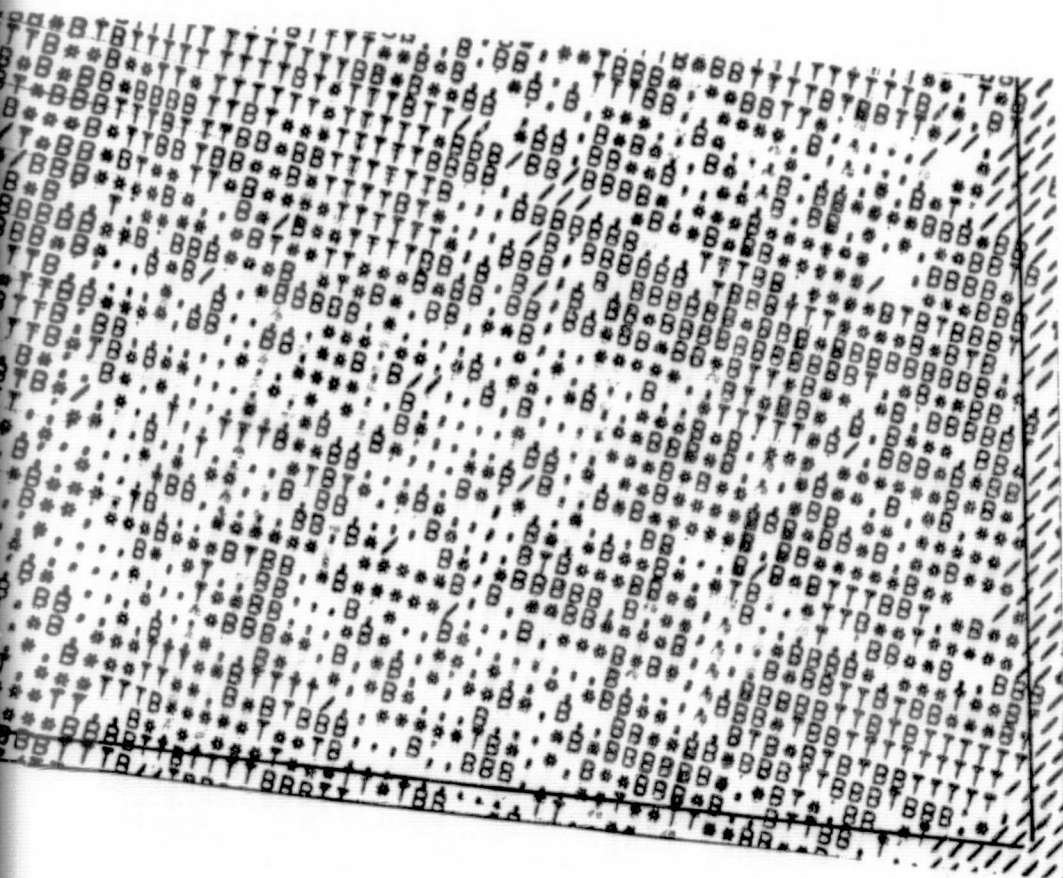
Figure 2
ST. JOHNS NATIONAL WILDLIFE REFUGE
CLASSIFICATION MAP

T Trees, shrubs
B Dense spartina
* Medium density spartina
. Sparse spartina
blank - Water
/ Highways

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FOOTNOTES

FOOTNOTES



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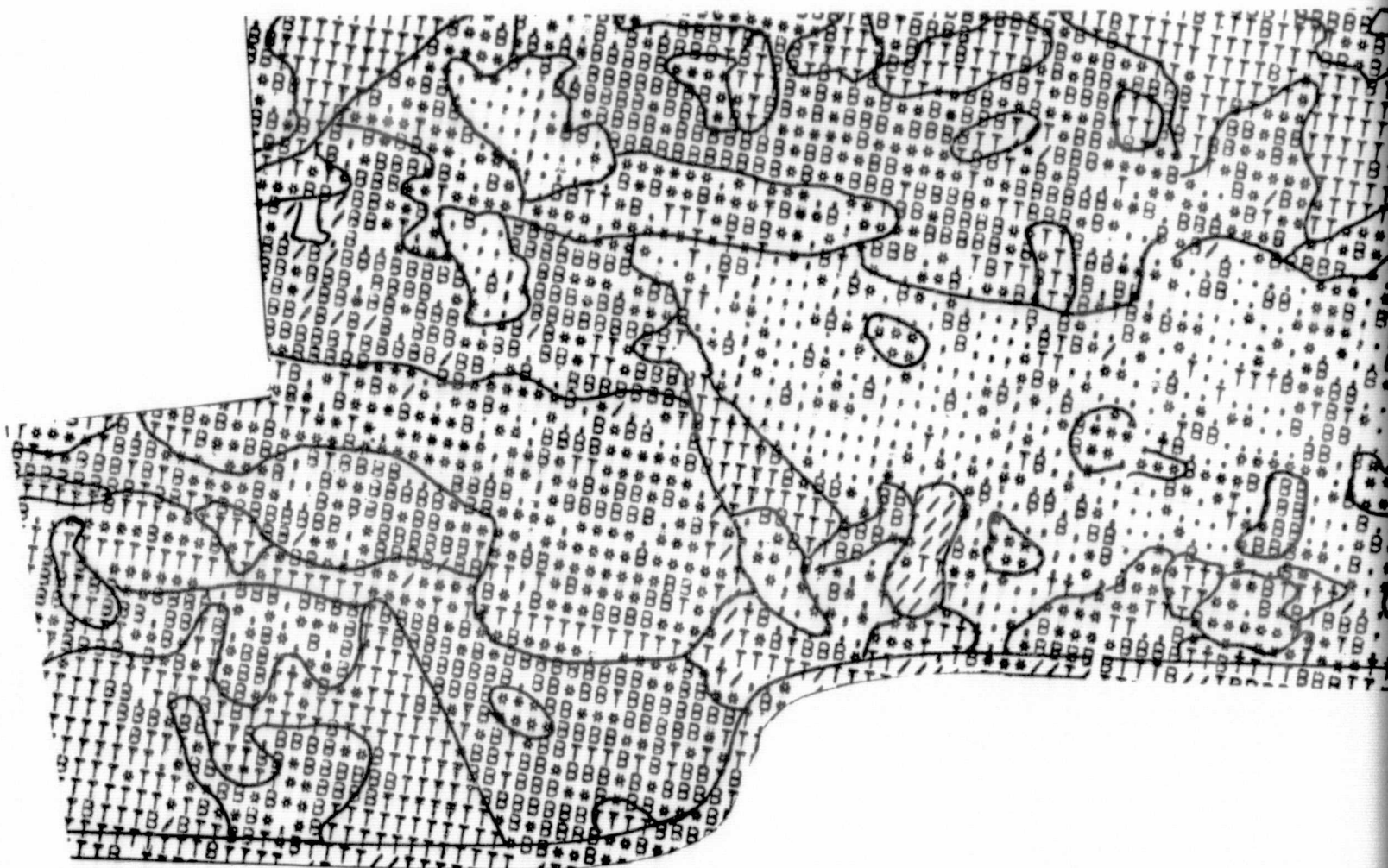


Figure 3
ST. JOHNS NATIONAL WILDLIFE REFUGE
VEGETATION PATTERNS

T Trees, Shrubs
B Dense spartina
* Medium density spartina
· Sparse spartina
blank - Water
/ Highway

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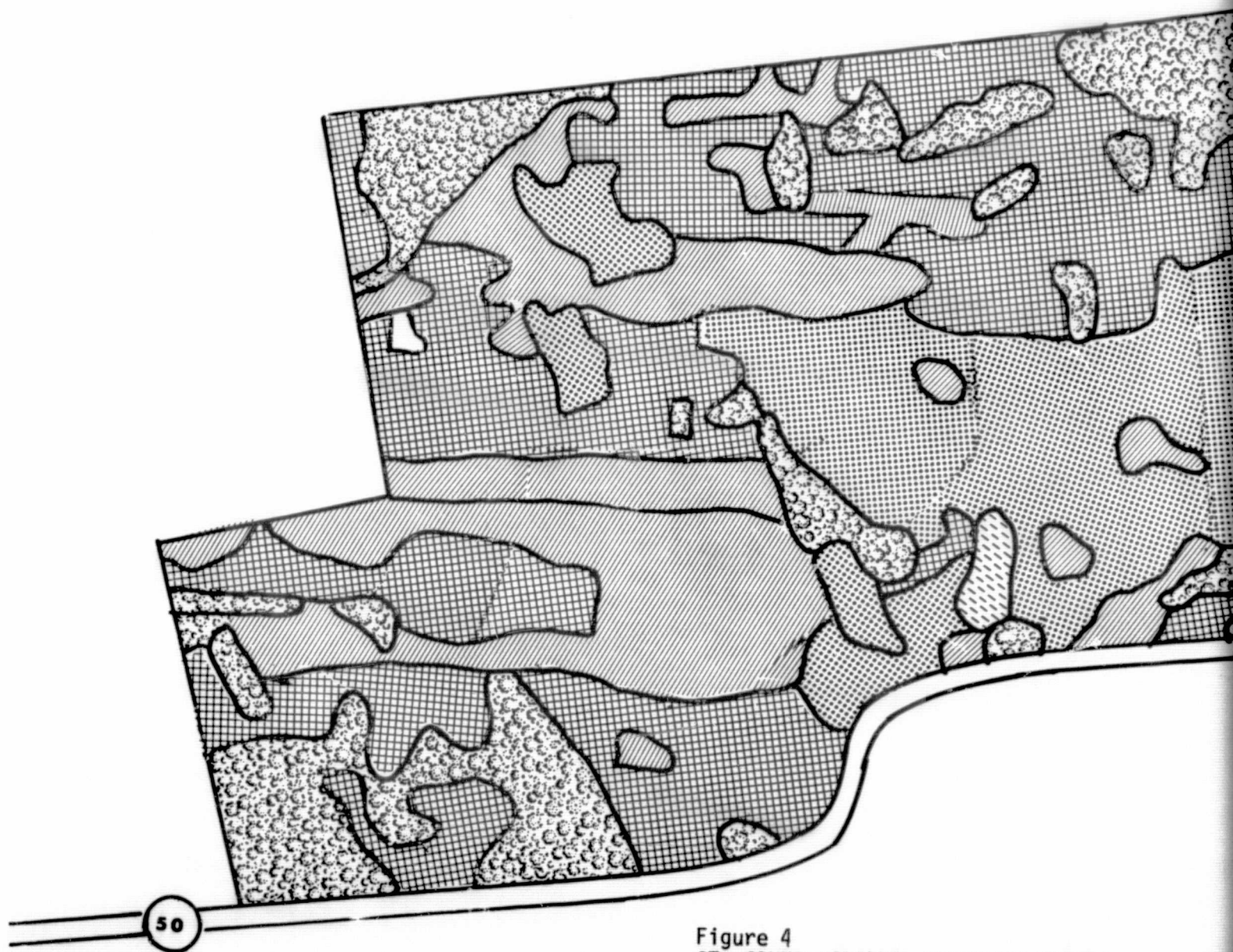


Figure 4
ST. JOHNS NATIONAL WILDLIFE REFUGE
SIMPLIFIED LANDSAT CLASSIFICATION MAP

Trees, shrubs

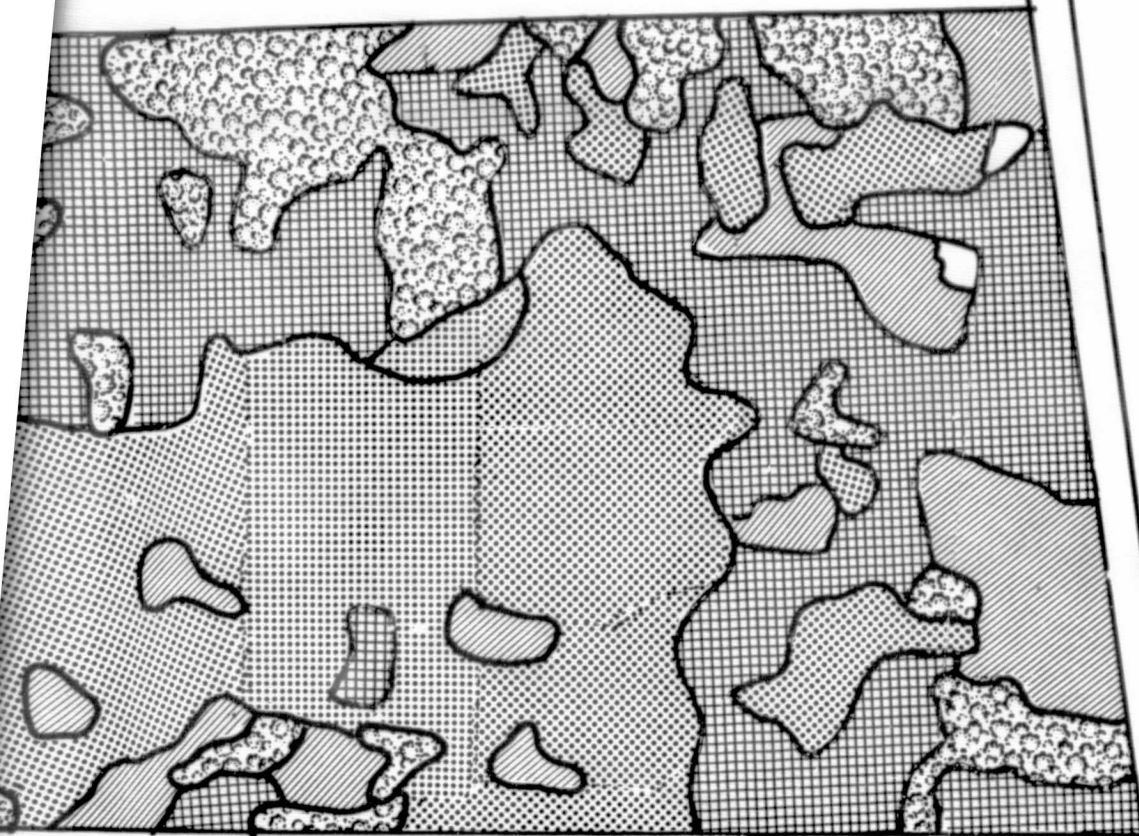
Dense spartina

Medium density spartina

Sparse spartina



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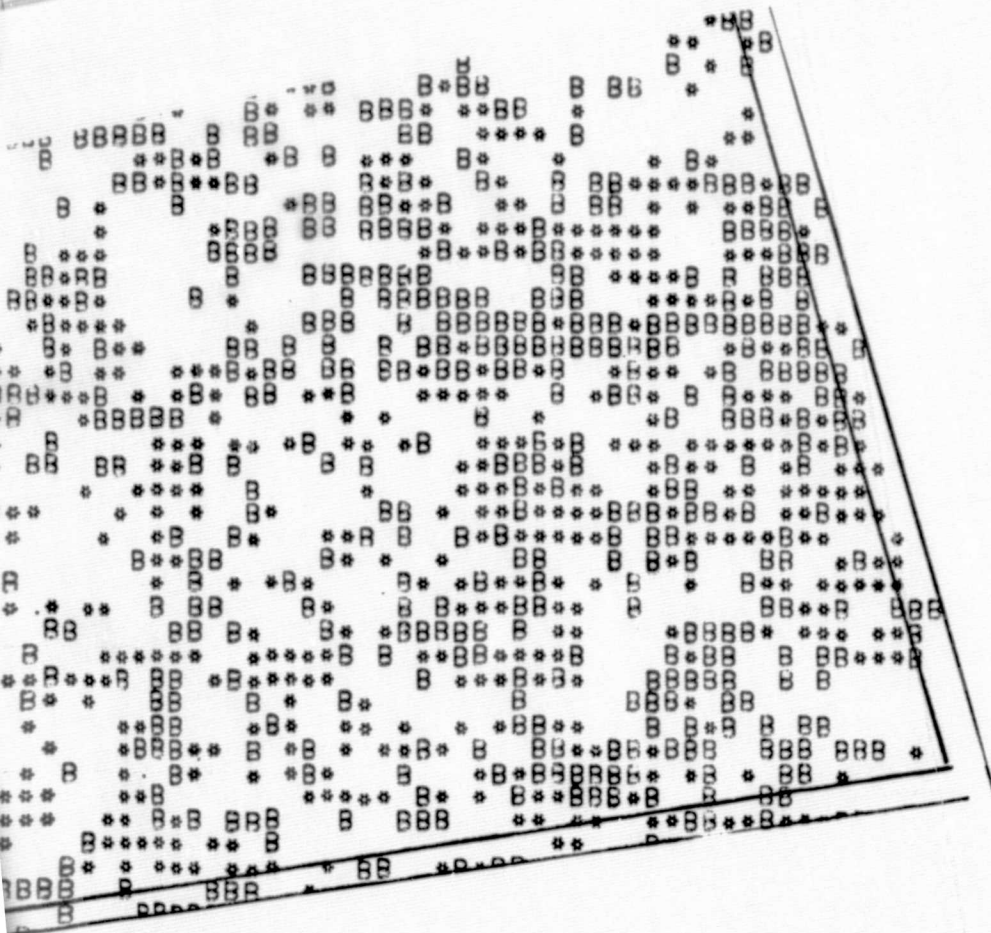


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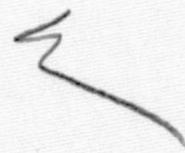


Figure 5
 ST. JOHNS NATIONAL WILDLIFE REFUGE
 DUSKY SEASIDE SPARROW PREFERRED HABITAT
 B Dense Spartina
 * Medium density spartina

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is the region of higher character density. Proximity of trees can be checked by referring to Figure 2 or 3.

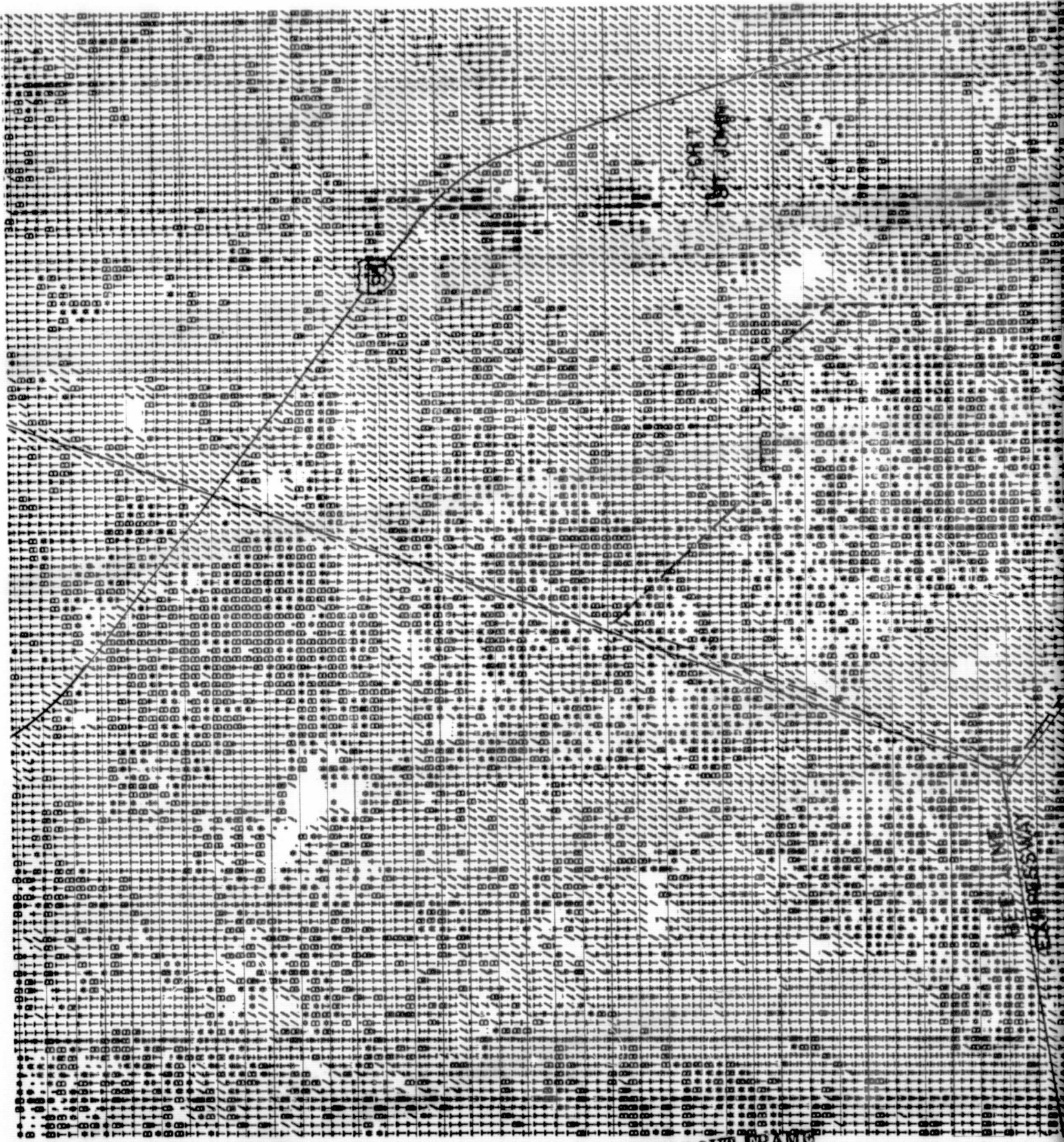
Areas associated with the various classes have been obtained by counting characters by computer and by using a planimeter to measure the areas of the classes mapped in Figures 1 and 4. Results obtained by the three methods are listed in Table 1. Lower water areas for the Landsat data than for the photography-based maps may be due, at least in part, to a difference in seasons. The date of the Landsat pass is April 28, which is in the dry season; the photography was taken in November, which is in the wet season. Seasonal changes in appearance of spartina are small.

Beeline Expressway Region

The success of the Landsat system in mapping the sparrow's preferred habitat in the above case led to its use in evaluating another region under consideration for purchase as a refuge area for the bird. This region is located at the fork of the Beeline Highway and is outlined in the classification map of Figure 6. It is seen that this map does show a favorable habitat for this bird within the delineated region. It also shows some nearby regions which appear to provide the desired characteristics. Areas associated with the several classes (as obtained by character counting) within the delineated region are given by Table 2:

TABLE 1
ST. JOHNS WILDLIFE REFUGE

CLASS	MAP FROM PHOTOGRAPHY			LANDSAT CLASSIFICATION MAP					
				SIMPLIFIED (FIGURES 3, 4) USING PLANIMETER			BY COUNTING CHARACTERS		
	HECTARES	ACRES	PERCENT OF TOTAL	HECTARES	ACRES	PERCENT OF TOTAL	HECTARES	ACRES	PERCENT OF TOTAL
DENSE SPARTINA	480	1187	28	584	1443	34	538	1330	31
MEDIUM DENSITY SPARTINA	456	1126	26	349	862	20	480	1186	28
SPARSE SPARTINA	247	610	14	465	1149	27	357	882	21
TREES, SHRUBS	380	939	22	300	742	18	358	884	21
WATER	73	181	4	5	12	--	7	18	
POWER LINE	13	31	1						
UNCLASSIFIED	3	7	--						
MIXED: TREES, SHRUBS- MEDIUM DENSITY SPARTINA	43	105	2						
MIXED: DENSE SPARTINA- MEDIUM DENSITY SPARTINA	45	110	3						
TOTAL	1740	4296		1703	4208		1740	4300	



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Figure 6
BEE LINE HIGHWAY REGION
T Trees, shrubs
B Dense spartina
* Medium density spartina
• Sparse spartina
Blank - Water
/ Highways, bare sand, urban features

92

TABLE 2
AREAS BY CLASS IN BEELINE EXPRESSWAY REGION

CLASS	AREA		PERCENT OF TOTAL
	HECTARES	ACRES	
Water	4	11	1
Dense Spartina	193	476	24
Medium Density Spartina	203	501	25
Sparse Spartina	131	324	16
Trees, Shrubs	145	357	18
Highway Construction, Bare Sand	143	354	18
TOTAL	819	2023	

To show the favorable regions more clearly, Figure 7 is a thematic map showing only dense spartina and medium density spartina.

Another factor to be considered is urban encroachment in the surrounding region. This is shown as a thematic map in Figure 8. Since bare sand appears in this class along with urban features, local knowledge or checking must be used to distinguish the two in a map of this type. On this map, the patches of slashes are identified as follows:

- 1,3,6,7,9 - bare sand around a borrow pits used in the highway construction.
- 2, 8 - bare sand.
- 4 - electrical power line.
- 5 - Port St. John - residential development, most of which is presently a network of streets without houses.
- 10 - dump.
- 11 - residential development.



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Figure 7
BEE LINE HIGHWAY REGION

B Dense spartina
* Medium density spartina



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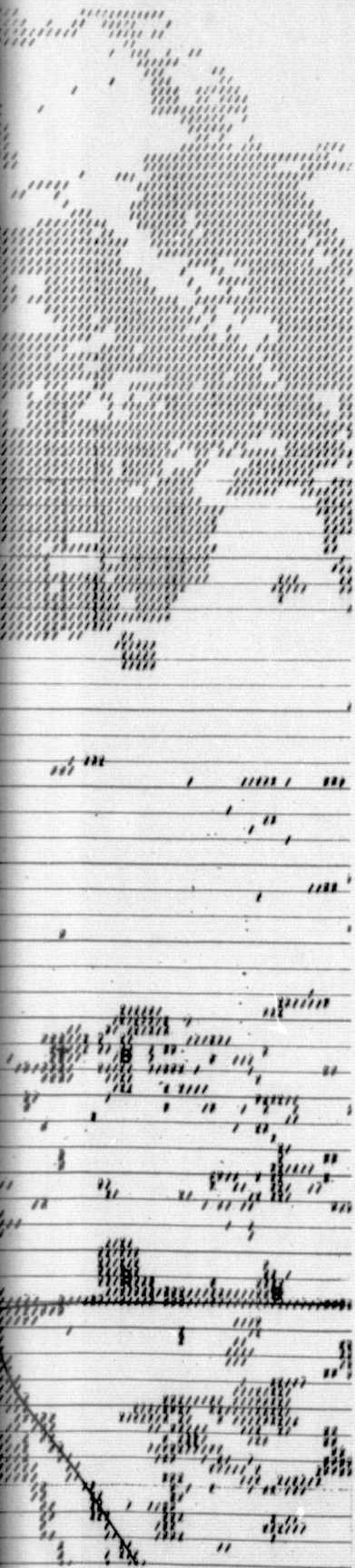


Figure 8
 BEELINE HIGHWAY REGION
 HIGHWAYS, BARE SAND, AND URBAN FEATURES

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C. SIGNIFICANT RESULTS

See Section B.

D. PUBLICATIONS

A report, "Satellite Information on Orlando, Florida" was presented June 11 at the Earth Resources Survey Symposium in Houston, Texas and is scheduled to appear in the proceedings of that symposium.

E. RECOMMENDATIONS

None

F. FUNDS EXPENDED

Expenditures this quarter: \$4,382.49

G. DATA USE

<u>VALUE OF DATA ALLOWED</u>	<u>VALUE OF DATA ORDERED</u>	<u>VALUE OF DATA RECEIVED</u>
\$1,200	\$147	\$147

During this quarter, seven sets of images have been received. None of them is cloud free, but most points of interest are clear of clouds on at least one of the images. No digital tapes have been ordered as yet.